INVESTIGATOR'S ANNUAL REPORT

United States Department of the Interior

National Park Service

All or some of the information you provide may become available to the public.

OMB # (1024-0236)
Exp. Date (11/30/2010)
Form No. (10-226)

Reporting Year: 2010	**Park:** Shenandoah NP	**Select the type of permit this report addresses:** Scientific Study

Name of principal investigator or responsible official: Carl Rothfels	**Office Phone:** 9199430227
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Additional investigators or key field assistants (first name, last name, office phone, office email)
No co-investigators

Project Title (maximum 300 characters):
Polyploidy and diversification in Cystopteris and Gymnocarpium

Park-assigned Study or Activity #:	**Park-assigned Permit #:**	**Permit Start Date:**	**Permit Expiration Date:**
SHEN-00385	SHEN-2010-SCI-0019	Sep 08, 2010	Dec 31, 2010

Scientific Study Starting Date:	**Estimated Scientific Study Ending Date:**
Sep 08, 2010	Dec 31, 2010

For either a Scientific Study or a Science Education Activity, the status is:	**For a Scientific Study that is completed, please check each of the following that applies:**
Completed	_X_ A final report has been provided to the park or will be provided to the park within the next two years __ Copies of field notes, data files, photos, or other study records, as agreed, have been provided to the park _X_ All collected and retained specimens have been cataloged into the NPS catalog system and NPS has processed loan agreements as needed

Activity Type:
Research

Subject/Discipline:
Plant Communities (Vegetation)

Purpose of Scientific Study or Science Education Activity during the reporting year (maximum 4000 characters):
This project intends to unravel the complex of taxa within the cosmopolitan fern genera Cystopteris and Gymnocarpium, with a particular emphasis on the effect of chromosome-doubling events (polyploidy) on diverification rates. It also intends to place these genera within the context of broader fern evolution (especially with respect to their phylogenetic position within the eupolypods II clade).

Findings and status of Scientific Study or accomplishments of Science Education Activity during the reporting year (maximum 4000 characters):
Fieldwork was completed this year; analysis (morphological and DNA) is ongoing.

For Scientific Studies (not Science Education Activities), were any specimens collected and removed from the park but not destroyed during analysis?
Yes
If "Yes", identify where the specimens currently are stored:

DUKE -- the herbarium of Duke University.

The specimens are: CJR3891, 3892, 3893, 3895 (all Cystopteris fragilis s.l.); CJR3896, 3897, 3898, 3899, 3900 (all G.appalachium); and CJR3894 (Deparia achrostichoides).

Funding specifically used in this park this reporting year that was provided by NPS (enter dollar amount):	**Funding specifically used in this park this reporting year that was provided by all other sources (enter dollar amount):**
$0	$0

List any other U.S. Government Agencies supporting this study or activity and the funding each provided this reporting year: